

the structure of this organ in some other species of byssus-forming bivalves.

**AQUATIC RESPIRATION.**—Some experiments on the breathing of aquatic animals (both fresh and salt water) have been recently described by MM. Jolyet and Regnard in the *Archives de Physiologie*. The results are briefly as follows:—These animals, living in a medium very poor in oxygen, and having a blood-liquid with small respiratory capacity, have the least vigorous respiration. In the free natural act of respiration the oxygen which disappears is not exactly represented by the oxygen in the carbonic acid produced; the ratio  $\frac{CO_2}{O}$  is always less than 1;

i.e., aquatic animals, in the normal state, never give off more carbonic acid than the oxygen they absorb. (The opposite result got by some physiologists is attributed to keeping the animals in an enclosed medium whose oxygen they gradually exhausted.) As with other animals, heat-variations in the surrounding medium has a marked influence on the chemical phenomena of respiration. Taking 2° and 30° as the limits of bearable external temperature, the quantities of the absorbed oxygen vary (other conditions being equal) in the ratio of 1 to 10. Among other causes which may have an influence on the vigour of breathing (apart from those connected with species) the most important, after temperature, are the state of hunger and digestion, the amount, and the greater or less intensity of muscular action. In the experiments there was sometimes a slight development of nitrogen, sometimes an absorption. No definite opinion could be expressed with reference to this point.

#### GEOGRAPHICAL NOTES

**EXPLORING COLONIES.**—The Société des Colons Explorateurs, lately organised in Paris, is developing a most healthful degree of activity. Its purpose is to organise a systematic method of exploration and colonisation, based on the same principles as those which animate the newly-founded international society for the exploration and civilisation of Africa, but embracing in its field all the undeveloped portions of the globe. The Society has formed two councils to direct its operations. In the first, which is charged with the scientific, geographical, and exploratory sections, we notice the names of Malte-Brun, de Lesseps, de Quatrefages, Milne-Edwards, Admiral La Roncière le Noury, &c. The second, devoted more especially to agriculture, commerce, and industry, embraces Michael Chevalier, Tisserand, Col. Solignac, F. Garnier, and other well-known names. The plan adopted by the Society for the attainment of its objects is eminently practical. A colony is formed from representatives of various classes and occupations, who are well fitted to investigate and develop the resources of a new country; it is provided with a complete equipment, and despatched to a promising locality. Here a firm foothold is established, and the new settlement made, as soon as possible, not only self-supporting, but a centre for geographical and general scientific investigation. The band of permanent colonists are accompanied by a certain number, who, after obtaining a degree of familiarity with the difficulties to be overcome in a new settlement, are ready to form the nucleus of a new colony. In this manner not only will the various colonies increase the sphere of their activities at a rapid rate, but drill at the same time groups of hardy explorers well fitted to extend the circle of the Society's undertakings. The first experimental colony has already been started on the coast of Sumatra, and embraces in its *personnel* graduates of the leading technical and professional schools of Paris. If this simple practical programme is carried out successfully, it is evident that the new Society, increasing the extent of its operations in arithmetical progression, will

soon become a most important factor in the slow process of civilising the world.

**SUMATRA.**—In the January session of the Dutch Geographical Society it was announced that Lieut. Cornelissen had been appointed to take charge of the Sumatra exploring expedition, lately deprived by death of its commander, M. Schow-Sandvoort. He leaves in March to assume the direction of the explorations. During the past three months 14,000 guilders have been contributed for the Sumatra exploring fund.

**NIAS ISLAND.**—In Petermann's *Mittheilungen* for February is a very full account, with map, of the Island of Nias, on the west of Sumatra, by Dr. A. Schreiber. The island now belongs to the Dutch, and by them has in recent years been pretty thoroughly explored. The island is hilly, the highest summit being 2,000 feet, the formation being mostly sandstone and coral.

**ARCTIC EXPLORATION.**—Admiral La Roncière le Noury in his capacity of president of the Paris Geographical Society, M. Quatrefages, and M. Maunoir, general secretary, have written an official letter to Capt. Howgate, U.S.A., conveying to him their approbation of his scheme for establishing a polar colony in Lady Franklin Bay. They trust this document may induce the Congress to vote the required credit for starting the contemplated expedition. They express, moreover, their gratitude for the sending out of Capt. Tyson's preliminary expedition, and they trust Capt. Howgate will soon be in a position to take advantage of the means which his hardy lieutenant has been sent to collect. Capt. Howgate has written to the Danish Government, asking them to send instructions to the Disco authorities, authorising them to place the Government storehouse at the disposal of Capt. Tyson, if he has failed in collecting a sufficient number of furs during the present winter season. Mr. S. R. Van Campen has been asked by the Hon. B. A. Willis, of the Committee on Naval Affairs in the United States Congress for a report on the Arctic expeditions abroad, and has complied with the request. Besides speaking particularly of the proposed expeditions of Holland and Sweden, Mr. Van Campen suggests to the Committee, as it has in charge the bill now before Congress for an American expedition, proposed in accordance with Capt. Howgate's scheme, the incorporation of a clause granting rewards upon a graduated scale to individual explorers of whatever nationality, who may reach latitudes or make discoveries in Arctic territory beyond points hitherto attained.

**ROHLFS' EXPEDITION.**—Herr Gerhard Rohlfs has received no less than 300 applications for participation in his expedition to the Libyan Desert. Of course the great traveller can only consider very few of them. We learn further that he intends also to explore the Shari, Binue, and Ogowai Rivers and their tributaries. We hope he will succeed in accomplishing this, as it will solve many of the questions raised by Stanley's discovery of the course of the Congo. The date of his departure is not yet fixed.

**SPITZBERGEN.**—A very interesting series of nine maps of Spitzbergen, partly rare and little known, are published in the *Tijdschrift* of the Amsterdam Geographical Society, with an essay by Capt. de Bas, on the geographical names of Spitzbergen. The maps begin with that of Barentz's third voyage of 1596, followed by those of Gerritz, 1612; Edge, 1625; Middlehoven, 1634; Daniel, 1642; two others of 1648, and the latter half of the seventeenth century; that of Johannes van Keulen, 1710, and finally the Duncr-Nordenskjöld map of 1864.

**JAPAN.**—In the *Monatsbericht* of Petermann's *Mittheilungen* for February, Dr. Behm gives some information concerning recent geographical work in Japan. There is an itinerary by Dr. Schulz, of a journey he made in

August, 1877, from Tokio to Hatsuishi (Nikko), and from Nikko to Takasaki; an account of the observations made by Dr. Naumann last summer during a journey into the little known western part of Nippon, and another at the same time into the north of that island by Herr Gebauer; and some information from the *Tokio Times*, by Y. Watanabe, on Chikuzen, a province in the north-west of the Kiushiu.

### NOTES

THE following grants have just been made from the Research Fund of the Chemical Society to aid the carrying out of the following researches:—50*l.* to Dr. Wright, of St. Mary's Hospital Medical School for the continuation of his researches in chemical dynamics; 25*l.* to Dr. Armstrong for an investigation of camphor and allied compounds; 20*l.* to Dr. Carnelly, of Owens College, Manchester, for a research on the hydrocarbons diphenyl, ditolyl, &c., and their derivatives; 10*l.* to Mr. P. Phillips Bedson, of Owens College, Manchester, for a research on derivatives of phenyl acetic acid, and on the constitution of isatin; and 5*l.* to Mr. J. R. Crow, of Owens College Manchester, for a research on the action of zinc ethyl on the chloride of vanadium.

WE regret to announce the death, at Nice, of the celebrated Danish conchologist, Dr. A. L. Mörch.

WE hear with great regret, from an Italian correspondent, that the well-known astronomer, Father Secchi, has been seriously ill for several weeks, and that little hope is entertained of his recovery. The Roman correspondent of the *Lancet* states, however, that Dr. Ceccarelli, who is attending him, does not absolutely despair of his recovery. Father Secchi is not yet sixty, and is of robust frame.

AT the General Monthly Meeting of the Royal Institution on Monday, Dr. Warren De la Rue, D.C.L., F.R.S., in the chair, the special thanks of the members were given to Mr. William Bowman, F.R.S., for his present of an ivory bust of Prof. Faraday, by the late Matthew Noble, M.R.I. In reference to the telephone which Mr. Preece had explained to the members last Friday, the chairman stated that he had made attempts to measure the current produced by the vibrations of the disc of iron in front of the magnet of the telephone, and that he was unable to detect any by means of a most sensitive dynamometer which would render evident the current of a Daniell's cell through 2,000 ohms. Moreover, by other experiments made by other means, he concluded that the current produced did not amount to that which a Daniell's cell would send working through 100,000,000 ohm resistance.

THE New York *Tribune* gives an account of a public exhibition in that city of Eddison's Phonograph, which seems to have been very successful. The tones reproduced by the vibrating disk of the machine were so distinct that they could be heard and understood in different portions of the crowded room. Words spoken in a high key and with forcible emphasis were reproduced with much greater distinctness than those spoken in a low tone, even when the latter were uttered very loudly. A difference in the sound of different voices could be easily discerned. Several fragments of songs were sung in a high key and repeated by the machine with wonderful fidelity. The inventor stated that the machine has yet to be perfected before its full power is developed, and that ultimately it can be used to receive and reproduce the songs of popular singers as they are rendered on the stage.

AT a recent meeting of the Royal Society of Edinburgh, in connection with a letter from New York describing the phonograph, Sir William Thomson gave some explanation of the

machine. All previous attempts to record sound were, he said, founded on the motion of a style or marker at a true parallel to the paper. Mr. Eddison's ingenious invention of the electric pen was different. It consisted of a fine point, which, by an excessively rapid vibration perpendicular to the paper, caused by a small electric machine connected with two thin wires to the point, left a trace of any person's handwriting in a row of very fine holes, from which the handwriting could be printed. Mr. Eddison, from this invention, elaborated the phonograph. By the greater or less pressure produced through the action of the alternate condensation and expansion of the air caused by the mechanism of the voice, the diaphragm operated upon the point and recorded the sounds. It was the most interesting mechanical and scientific invention they had heard of in this century. There could be no limit to its application. A man could speak a letter through the phonograph—it would be recorded on tinfoil, sent in an envelope through the post, and his friend, by applying the point of the phonograph to the tinfoil, could reproduce the words and tones uttered. In fact they could take down the singing of a Titians (had we one), which might be reproduced to a tone two hundred years hence.

BOTH Houses of Legislature have unanimously passed a resolution giving the thanks of the U.S. Congress to Mr. Henry M. Stanley for his achievements in the field of African exploration. Mr. Stanley meets the Geographical Society in St. James's Hall to-night. It would be interesting to know how many applicants beyond the 2,000, which the hall will hold, have been disappointed. The officials of the Society have had a trying time of it in attending to the loads of applications they have received. Mr. Stanley will be entertained at dinner by the Society on Saturday.

In connection with the recent election of Prof. Simon Newcomb as a foreign member of the Royal Society, it was stated that previous to that Prof. Asa Gray was the only living American who enjoyed that honour. We find, however, among the list of foreign members the name also of Prof. Benj. F. Peirce, of Cambridge, Mass.

WE have received an interesting volume: "*Estudios sobre la flora y fauna de Venezuela*," by A. Ernst. The author, in two ably written articles, gives a general idea of each of the two large kingdoms as they appear in Venezuela, and further adds some details on the fungi, orchids, molluscs, and birds of that country. The book is published at Caracas, and consists of over 100 quarto pages.

THE first meeting of the Institute of Chemistry of Great Britain and Ireland was held on Friday afternoon at the rooms of the Chemical Society, Burlington House. Prof. Frankland, F.R.S., the first President, read an address in which he gave an account of the origin of the institute. At a dinner given to Prof. Canizzaro on the occasion of his visit to London in May, 1872, Prof. Frankland drew attention to the increasing importance of chemistry in relation to the wants of communities, and suggested the usefulness of an institute that should be to chemists what the Colleges of Physicians and Surgeons are to the medical profession, the Institute of Civil Engineers is for civil engineers, and the Inns of Court are to the legal profession. Although the need of experts in connection with water and gas analysis, legal proceedings, and nuisances was recognised, and the application of chemistry to agriculture and manufactures was known to be of great importance, the suggestion was not taken up in a practical way until the beginning of 1876, when a meeting to consider the subject was held at the rooms of the Chemical Society on April 26. A committee was appointed to draw up a scheme for the constitution of the institute, which was laid before a meeting held in November. At one time it was thought that the objects might be effected by